

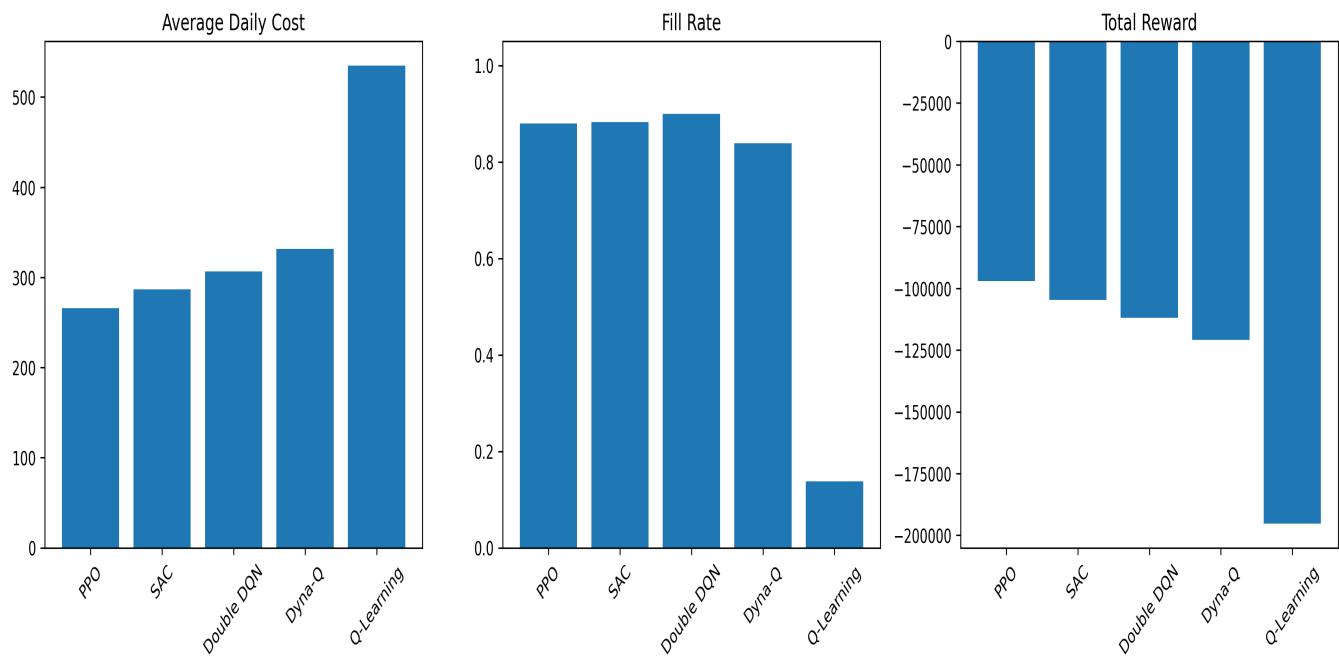
Inventory Management RL Evaluation Report

Generated: 2025-11-30 14:51:42

Summary Comparison

Algorithm	Avg Cost	Fill Rate	Stockout Rate	Avg Inventory	Total Reward
PPO	\$265.89	87.96%	20.49%	67.3	-97050.57
SAC	\$286.87	88.22%	22.58%	65.3	-104708.56
Double DQN	\$306.54	89.97%	15.70%	98.1	-111887.30
Dyna-Q	\$331.36	83.84%	22.19%	111.2	-120946.10
Q-Learning	\$535.08	13.73%	99.04%	0.2	-195303.80

Performance Comparison Plots



Detailed Evaluation Results

Model naming for qlearning:

[1] Auto-generate name
[2] Enter custom name
Choice (1/2): Generated name: 20251130_145022
Episode 20, total reward = -147704.00
Episode 40, total reward = -122618.00
Episode 60, total reward = -145019.00
Episode 80, total reward = -118329.00
Episode 100, total reward = -116777.00
Episode 120, total reward = -119857.00
Episode 140, total reward = -132168.00
Episode 160, total reward = -123952.00
Episode 180, total reward = -119990.00
Episode 200, total reward = -116051.00
Episode 220, total reward = -120307.00
Episode 240, total reward = -113723.00
Episode 260, total reward = -112094.00
Episode 280, total reward = -117436.00
Episode 300, total reward = -121116.00
Episode 320, total reward = -122221.00
Episode 340, total reward = -109126.00
Episode 360, total reward = -111519.00
Episode 380, total reward = -114277.00
Episode 400, total reward = -115435.00
Episode 420, total reward = -117807.00
Episode 440, total reward = -127248.00
Episode 460, total reward = -123290.00
Episode 480, total reward = -120729.00
Episode 500, total reward = -126079.00
Episode 520, total reward = -123124.00
Episode 540, total reward = -124703.00
Episode 560, total reward = -129459.00
Episode 580, total reward = -116171.00
Episode 600, total reward = -119973.00
Episode 620, total reward = -127438.00
Episode 640, total reward = -132399.00
Episode 660, total reward = -148897.00
Episode 680, total reward = -136076.00
Episode 700, total reward = -116165.00
Episode 720, total reward = -116478.00
Episode 740, total reward = -111011.00
Episode 760, total reward = -121116.00
Episode 780, total reward = -123593.00
Episode 800, total reward = -110805.00
Episode 820, total reward = -114250.00
Episode 840, total reward = -134376.00
Episode 860, total reward = -118919.00
Episode 880, total reward = -121280.00
Episode 900, total reward = -123243.00

Episode 920, total reward = -128871.00
Episode 940, total reward = -117226.00
Episode 960, total reward = -125517.00
Episode 980, total reward = -142185.00
Episode 1000, total reward = -149161.00

Q-Learning Evaluation Report

COSTS

Avg Daily Cost: \$535.08 (+/-4.16)
Holding Cost: \$76.80
Stockout Cost: \$179593.00
Ordering Cost: \$15634.00

SERVICE LEVEL

Fill Rate: 13.7%
Stockout Rate: 99.0%

INVENTORY

Avg Inventory: 0.2 units

PERFORMANCE

Total Reward: -195303.80
Found 1 saved model(s):
[1] ppo_model_20251129_115221
[N] Train new model

PPO Evaluation Report

COSTS

Avg Daily Cost: \$265.89 (+/-5.03)
Holding Cost: \$24548.85
Stockout Cost: \$24900.26
Ordering Cost: \$47601.46

SERVICE LEVEL

Fill Rate: 88.0%
Stockout Rate: 20.5%

INVENTORY

Avg Inventory: 67.3 units

PERFORMANCE

Total Reward: -97050.57
Found 2 saved model(s):
[1] 20251125_000337
[2] sac_inventory
[N] Train new model

SAC Evaluation Report

COSTS

Avg Daily Cost: \$286.87 (+/-6.95)
Holding Cost: \$23851.66

Stockout Cost: \$24541.00
Ordering Cost: \$56315.89

SERVICE LEVEL

Fill Rate: 88.2%
Stockout Rate: 22.6%

INVENTORY

Avg Inventory: 65.3 units

PERFORMANCE

Total Reward: -104708.56
Found 1 saved model(s):
[1] 20251125_011757
[N] Train new model

Dyna-Q Evaluation Report

COSTS

Avg Daily Cost: \$331.36 (+/-14.21)
Holding Cost: \$40597.10
Stockout Cost: \$33717.00
Ordering Cost: \$46632.00

SERVICE LEVEL

Fill Rate: 83.8%
Stockout Rate: 22.2%

INVENTORY

Avg Inventory: 111.2 units

PERFORMANCE

Total Reward: -120946.10
DOUBLEDQN
Found 1 saved model(s):
[1] 20251125_012040
[N] Train new model

Double DQN Evaluation Report

COSTS

Avg Daily Cost: \$306.54 (+/-5.17)
Holding Cost: \$35812.30
Stockout Cost: \$20981.00
Ordering Cost: \$55094.00

SERVICE LEVEL

Fill Rate: 90.0%
Stockout Rate: 15.7%

INVENTORY

Avg Inventory: 98.1 units

PERFORMANCE

Total Reward: -111887.30

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Double DQN	\$306.54	89.97%	15.70%	98.1	-111887.30
Dyna-Q	\$331.36	83.84%	22.19%	111.2	-120946.10
Q-Learning	\$535.08	13.73%	99.04%	0.2	-195303.80